General Game Theory TPZS Solutions of mxn by LP, with a_{ij} = payoffs

For row player
Let x_0 = Player I's security level when he plays strategy (x_1, …, x_m). This turns out =v, the value of the game.
x_i = probability plays row I, for I = 1,…,m.

LP:

Max x_0

Subject to:

(1) $\sum_{i=1}^{m} a_{ij} x_i \geq x_0, \text{ for j } = 1,2,\ldots., \text{ n.}$

(2) $\sum_{i=1}^{m} x_i = 1.$

(3) x_i 0, for all i.

Constraint (1) says expected payoff for I using (x_1, …, x_m) when II uses j. There are n such j's!

Constraint (2) and (3) makes (x_1, …, x_m) probabilities

See Washburn for similar setup for y: (Hint: can just use the duel)

Min y_0

Subject to:

(1) $\sum_{j=1}^{n} a_{ij} y_j \leq y_0, \text{ for i } = 1,2,\ldots., \text{ m.}$

(2) $\sum_{j=1}^{n} y_j = 1.$

(3) y_j 0, for all j.